REMARKS

Applicant expresses appreciation to the Examiner for consideration of the subject patent application. This amendment is in response to the Office Action mailed November 25, 2005. Claims 5, 6, and 21 were objected to. Claims 1-4, 7, 9-11, 18-20, and 22 were rejected. Claim 8 has been cancelled. The claims have been renumbered to address the duplicate claim 19 as identified by the Examiner.

The indication of allowed claims 12-17 is acknowledged with appreciation. Applicant also thanks the Examiner for the previous telephone conversation on October 21, 2005.

Claim Rejections - 35 U.S.C. § 102

Claims 1-4, 7-11, 18-20, and 22 (including independent claims 1, 3, 8, 9, and 19) were rejected under 35 U.S.C. § 102(b) as being anticipated by Bakenov.

Claim 1 of the present invention has been amended to include:

> "creating a control mesh with a substantially rectangular <u>structure and allowing T-junctions in at least one parameter direction</u>;
>
> inferring from the control mesh the tensor product B-spline basis functions for each control point"

Bakenov does not teach or suggest the operation of **inferring basis functions** from the control grid for a T-spline. Nor does Bakenov teach the operation of computing the surface based on the derived basis functions and control mesh.

With regard to claim 2, Bakenov does not describe "the step of determining the basis function for each control point using one non-hierarchical set of rules." Bakenov requires a large number of linear equations to even come close to the current solution and the linear equations may even be intractable.

With regard to new dependent claim 23, Bakenov does not describe a general method for locally refining a T-Mesh but only describes refinements in a very special case. Claim 23 includes the added operations of:

> "imposing a local knot coordinate system, in an area of the control mesh, based on the knot intervals;

generating a ray from the single control point in each of four directions on the control mesh to the two nearest edges of the control mesh in order to infer local knot vectors for control points; and

inferring basis functions for the control points using the knot vectors"

The Office Action states that Bakenov describes a method for local refinement. However, the Section 2.6 of Bakenov cited by the Office Action discusses the well-known local refinement of B-Spline curves. What is claimed in claim 23 is a **generalized** solution for the problem of performing local refinement of surfaces with T-junctions.

Independent claim 3 now includes the limitations of "inserting a single control point into the control mesh to form a T-junction" and "computing the Cartesian coordinates of the control point and of the neighboring control points using ~~the~~ inferred basis functions such that the bi-cubic spline surface is not geometrically altered".

The prior art does not teach nor suggest the limitations in claim 3 of being able to insert a single control point to form a T-junction and then being able to compute the Cartesian coordinates of the control point **without geometrically altering the surfaces**. This is possible because the present invention is able to infer the basis functions for a T-spline surface.

Claim 7 pertains to the merging of two NURBS surfaces into a single T-Spline surface. A specialized procedure for merging two NURBS surfaces was disclosed in Bakenov. However, the generalized solution provided by the "local refinement" step included in claim 7 is not described in Bakenov.

In reference to claim 9, the claimed operation of "inferring local knot vectors for control points in order to produce basis functions for the control points" is not described in Bakenov, nor is any functionally equivalent method described. Claim 10 describes further details for the process of claim 9 and likewise is not taught or suggested in Bakenov. The details of claim 11 are dependent upon claim 9 and claim 9 is patentably distinct.

Bakenov does not teach or suggest a method for extracting Bezier patches from a surface. As a result claim 18 should be allowed.

With respect to claim 19, while Bakenov has discussed merging T-splines, Bakenov does not teach or suggest in generality how to insert arbitrary control points into a T-mesh to enable any T-spline surfaces to be joined. Claims 20 and 21 are dependent on claim 19 and should also be allowed.

With respect to amended dependent claim 22, a locally refinable surface of any degree is not taught or suggested anywhere in Bakenov.
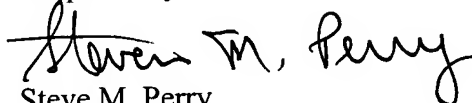
CONCLUSION

In light of the above, Applicant respectfully submits that pending claims 1-7 and 9-22 are now in condition for allowance. Therefore, Applicant requests that the rejections and objections be withdrawn, and that the claims be allowed and passed to issue. If any impediment to the allowance of these claims remains after entry of this Amendment, the Examiner is strongly encouraged to call Steve M. Perry at (801) 566-6633 so that such matters may be resolved as expeditiously as possible.

The Commissioner is hereby authorized to charge any additional fee or to credit any overpayment in connection with this Amendment to Deposit Account No. 20-0100.

DATED this 27th day of February, 2006.

Respectfully submitted,

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